WHAT IS CLAIMED IS:

1. A method for monitoring the quality of a photonic crystal fiber, the method comprising:

directing test light toward a side of a photonic crystal fiber;

detecting measurement light emerging from the photonic crystal fiber in response to the test light; and

monitoring the quality of the photonic crystal fiber based on the measurement light.

2. The method of claim 1, wherein the emerging light comprises reflected light.

3. The method of claim 1, wherein monitoring the quality of the photonic crystal fiber comprises determining a measurement spectrum of the measurement light.

4. The method of claim 3, wherein the measurement spectrum is related to the bandgap of the photonic crystal fiber.

5. The method of claim 3, wherein monitoring the quality of the photonic crystal fiber further comprises determining an error signal that is based on a function of the measurement spectrum.

6. The method of claim 5, wherein the function of the measurement spectrum is also a function of a reference spectrum.

7. The method of claim 6, wherein the reference spectrum is an empirically determined reference spectrum.

8. The method of claim 6, wherein the reference spectrum is a theoretically determined reference spectrum.

9. The method of claim 6, wherein the function is related to a difference between the measurement spectrum and the reference spectrum.

10. The method of claim 6, wherein the function is related to a weighted difference between the measurement spectrum and the reference spectrum.

11. The method of claim 1, further comprising drawing a photonic crystal fiber preform into the photonic crystal fiber while the measurement light is detected.

12. The method of claim 11, further comprising adjusting draw parameters based on the photonic crystal fiber quality.

13. The method of claim 1, wherein the photonic crystal fiber is a Bragg fiber.

14. The method of claim 1, wherein the photonic crystal fiber is designed to guide light having a wavelength between 1.2 microns and 1.7 microns.

15. The method of claim 1, wherein the photonic crystal fiber is designed to guide light having a wavelength between 0.7 microns and 1.0 microns.

16. The method of claim 1, wherein measurement light is detected over a range of angles.

17. The method of claim 1, wherein the detection of measurement light comprises collecting the measurement light with light collecting optics.

18. The method of claim 1, wherein monitoring the quality of the photonic crystal fiber comprises detecting structural defects in the photonic crystal fiber.

19. The method of claim 18, wherein the detection of structural defects is based on a spectrum of the measurement light.

20. The method of claim 1, wherein monitoring the quality of the photonic crystal fiber comprises detecting compositional defects in the photonic crystal fiber.

21. The method of claim 20, wherein the detection of compositional defects is based on a spectrum of the measurement light.

22. The method of claim 1, wherein monitoring the quality of the photonic crystal fiber comprises detecting differences between a measurement spectrum based on the measurement light and a reference spectrum.

23. The method of claim 1, wherein directing the test light comprises directing the test light to different regions of the photonic crystal fiber.

24. The method of claim 1, wherein directing the test light comprises simultaneously directing test light to the different regions of the photonic crystal fiber.

25. The method of claim 24, wherein detecting the measurement light comprises detecting the measurement light emerging from the regions of the photonic crystal fiber.

26. The method of claim 25, wherein monitoring the quality of the photonic crystal fiber comprises determining a measurement spectrum of each region of the photonic crystal fiber based on the measurement light.

27. The method of claim 1, wherein directing the test light includes focusing the test light onto the side of the photonic crystal fiber.

28. The method of claim 27, wherein detecting the measurement light includes gathering the measurement light scattered from the side of the photonic crystal fiber.

29. The method of claim 28, wherein a single optical component performs the focusing and gathering.

30. A method for monitoring the quality of an optical waveguide, the method comprising:

directing broadband test light to a side of an optical waveguide;

detecting measurement light reflected from the optical waveguide in response to the test light;

determining the measurement light intensity at a plurality of wavelengths; and

monitoring the quality of the optical waveguide based on a measurement spectrum of the measurement light.

31. The method of claim 30, wherein monitoring the quality of the optical waveguide comprises comparing the measurement spectrum to a reference spectrum.

32. The method of claim 30, wherein monitoring the quality of the optical waveguide comprises detecting structural defects in the optical fiber.

33. The method of claim 32, further comprising drawing an optical waveguide preform into the optical waveguide, wherein detecting the measurement light occurs during the drawing.

34. The method of claim 33, further comprising adjusting a draw parameter for the drawing based on the optical waveguide quality.

35. The method of claim 30, wherein monitoring the quality of the optical waveguide comprises detecting compositional defects in the optical fiber.

36. The method of claim 35, further comprising drawing an optical waveguide preform into the optical waveguide, wherein detecting the measurement light occurs during the drawing.

37. The method of claim 36, further comprising adjusting a draw parameter for the drawing based on the optical waveguide quality.

38. The method of claim 30, wherein the optical waveguide is a photonic crystal fiber

39. The method of claim 38, wherein the photonic crystal fiber is a Bragg fiber.

40. An apparatus for monitoring a photonic crystal fiber, the apparatus comprising:

a mount for supporting the photonic crystal fiber;

an illumination system which during operation directs test light to a side of the photonic crystal fiber; and

a detection system which during operation detects measurement light emerging from the photonic crystal fiber in response to the test light.

41. The apparatus of claim 40, further comprising a controller which during operation causes the illumination system to direct the test light and receive information based on the measurement light detected by the detection system.

42. The apparatus of claim 41, wherein during operation the controller determines a measurement light spectrum.

43. The apparatus of claim 42, wherein during operation the controller detects structural defects in the photonic crystal fiber based on the measurement light spectrum.

44. The apparatus of claim 43, further comprising a fiber drawing system which during operation draws a photonic crystal fiber preform into the photonic crystal fiber.

45. The apparatus of claim 44, wherein during operation the controller adjusts a draw parameter of the fiber drawing system based on the measurement light spectrum.

46. The apparatus of claim 42, wherein during operation the controller detects compositional defects in the photonic crystal fiber based on the measurement light spectrum.

47. The apparatus of claim 46, further comprising a fiber drawing system which during operation draws a photonic crystal fiber preform into the photonic crystal fiber.

48. The apparatus of claim 47, wherein during operation the controller adjusts a draw parameter of the fiber drawing system based on the measurement light spectrum.